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NeuroLOG: neuroscience application workflows execution on the EGEE grid

Javier Rojas Balderrama¹, Diane Lingrand¹, Erik Pernod²,
Jean-Christophe Souplet², Xavier Penne² and Johan Montagnat¹

¹: University of Nice - Sophia Antipolis / CNRS, France

²: INRIA Sophia Antipolis, France

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1 Description of the activity

Neuroscientists are manipulating large image data sets and complex collections of medical data. They are consumers of computing infrastructures to execute complex image analysis pipelines. In the context of the NeuroLOG project, tools and methods are deployed on top of gLite to ease the exploitation of the EGEE grid in neurosciences. The developments target medical data representation, data sets federation, secure storage, image analysis software deployment and grid workflows enactment.

2 Grid-added value

NeuroLOG specifically targets three neurological pathologies: brain strokes, brain tumors and multiple sclerosis. The project provides a brain medical image ontology and a metadata schema designed to represent information concerning the target pathologies. It proposes a middleware architecture by integrating existing tools (MOTEUR workflows enactor interfaced to the EGEE Grid, CORESE semantic query engine, Data Federator databases federation tool, etc) and developing missing components to address the requirements of neuroscientists. It targets the integration of data resources coming from 5 medical centers. It aims at providing a demonstrator by the end of the project (2010) that federates hundreds of data sets (hundred of GBs of data) and that can exploit the grid infrastructure to process 4 different neurological data analysis pipelines. The workflow processing engine will be interfaced to the data representation and query system to identify the data sets to be processed.

3 Impact

The EGEE grid infrastructure and middleware is providing a foundation layer on top of which to build neurosciences applications. However, the gap between the low level functionality provided (batch processing, distributed files management...) and the applications requirements (data flows processing, medical data representation...) is large. The NeuroLOG project aims at fostering the adoption of HealthGrids in a distributed pre-clinical community. It is adopting a user-centric perspective to meet the neuroscientists expectations. The tools and methodology enable the integration of heterogeneous site data schemas and the definition of a site-centric policy. The NeuroLOG middleware bridge the EGEE grid and local resources to provide a transitional model towards HealthGrids which is respective of users desires to control resources and data. The NeuroLOG middleware is currently used to enact an application to Multiple Sclerosis patient population analysis on the EGEE grid.

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¹Neurolog: <http://neurolog.polytech.unice.fr>